

California GARDEN

JANUARY-FEBRUARY 1984

Seventy-five Cents

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HORTICULTURE CALENDAR

Jan 7, 8

SAN DIEGO ROSE SOCIETY PRUNING DEMONSTRATIONS

Parker Rose Garden, Balboa Park, San Diego

Sat: 10:00 a.m. to 3:00 p.m. Sun: 10:00 a.m. to 2:00 p.m. Free

Jan 21, 22

SAN DIEGO CAMELLIA SOCIETY MINI-SHOW

Casa del Prado, Majorca Room, Balboa Park, San Diego

Sat: 11:00 a.m. to 5:00 p.m. Sun: 10:00 a.m. to 5:00 p.m. Free

Feb 2, 9, 16, 23

SAN DIEGO FLORAL EVENT

THURSDAY WORKSHOP

Free Floral Crafts Instruction – Open to the Public

San Diego Floral Association Garden Center, Balboa Park, San Diego

10:00 a.m. to 3:00 p.m. Information: Colleen Winchell 479-6433

Feb 4, 5

SAN DIEGO CAMELLIA SOCIETY 37th ANNUAL SPRING SHOW

Casa del Prado, Majorca Room, Balboa Park, San Diego

Sat: 1:00 to 5:00 p.m. Sun: 10:00 a.m. to 5:00 p.m. Free

Feb 18, 19

SAN DIEGO ORCHID SOCIETY SPRING MINI-SHOW

Casa del Prado, Majorca Room, Balboa Park, San Diego

Sat: Noon to 4:30 p.m. Sun: 10:00 a.m. to 4:30 p.m. Free

Feb 21

SAN DIEGO FLORAL EVENT

SAN DIEGO FLORAL ASSOCIATION MEETING

Program: By Victor H. Pinckney, Jr., Landscape Architect, So. Calif. Exposition

Majorca Room, Casa del Prado, Balboa Park, San Diego

Tuesday, 6:30 p.m. – “Open to the Public”

Hot Chicken Box Supper: \$2.00 per person

Information & Reservations (no later than Feb. 17th): 232-5762

(MON–FRI 10 AM–3 PM)

ENJOY THE WILDFLOWERS, BUT LEAVE THEM IN THEIR NATURAL HABITAT

California State Rare Plant Act, Senate Bill No. 308, reads in part “...it is generally unlawful to willfully or negligently cut, destroy, mutilate, or remove any tree or shrub, or other specified plants, growing upon state or county highway rights-of-way, or growing upon public land, or land not one’s own, without a written permit from the owner of the land signed by the owner or his authorized agent...”

SB 308 Native Plant Protection. This amendment became effective January 1, 1980 and requires “the department (Fish and Game) to establish criteria for determining if a species, subspecies, or variety of native plant is endangered or rare, as defined....to periodically inventory threatened native plants, and to biennially report to the Governor and the Legislature....authorize the commission (Fish and Game), after public hearing, to designate endangered and rare native plants, and require the department, to the extent the location of such plants is known, to notify the owner of such land and provide specified information...”

A complete list of California plants on the conservation list may be found in the booklet, *Inventory of Rare and Endangered Vascular Plants of California*, 1980, 2nd Edition, compiled by the California Native Plant Society and edited by James Payne. This is the authority recognized by the State of California.

A few of the more showy ones that you may see are:

Brodiaea filifolia—thread-leaved brodiaea.

Calochortus—mariposa tulip; *C. dunnii*—Dunn’s mariposa; *C. striatus*—alkali mariposa; *C. obispoensis*—San Luis mariposa.

Delphinium hesperium ssp. *cuyamaca*—Cuyamaca larkspur.

Fremontodendron decumben—Pine Hills flannel bush.

Lilium parryi—lemon lily.

Penstemon californicus—California bread tongue.



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AGAVES

DOROTHY DUNN

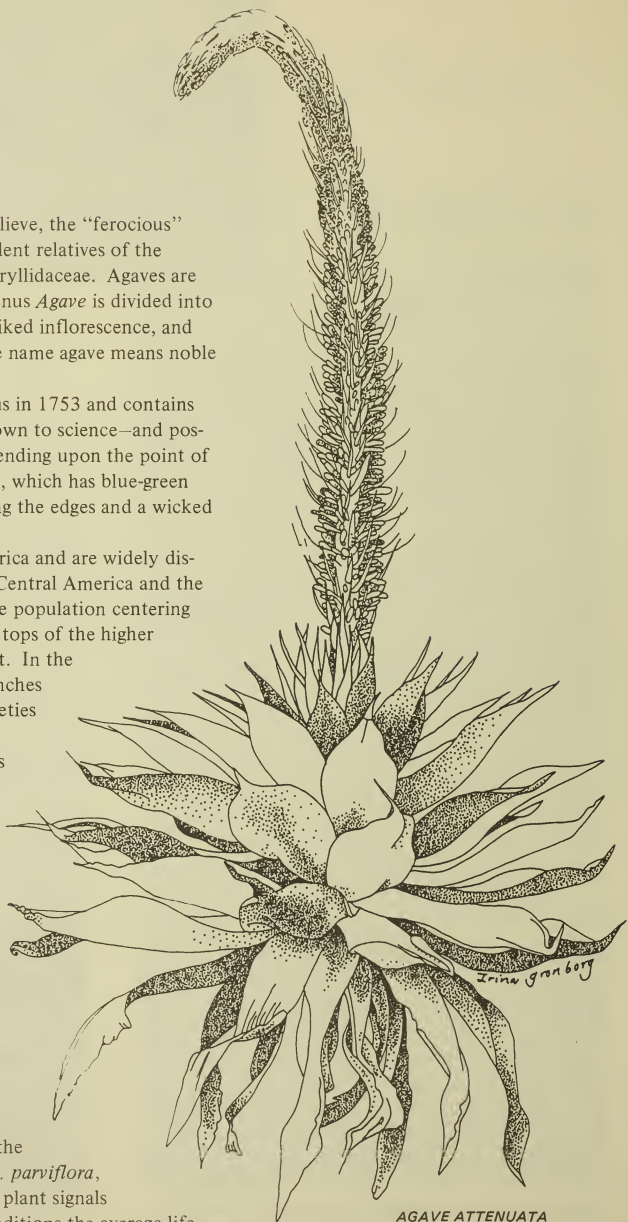
Photos by BILL GUNTHER

ALTHOUGH IT IS somewhat difficult to believe, the "ferocious" agaves were until recently classified as succulent relatives of the amaryllis, belonging to the large family Amaryllidaceae. Agaves are now in a separate family, Agavaceae. The genus *Agave* is divided into two natural sub-genera: *Littaea*, having a spiked inflorescence, and *Agave*, having a branched inflorescence. The name agave means noble in Greek.

Agave was first described by Linnaeus in 1753 and contains more than 300 species. The first species known to science—and possibly still the best known (or notorious, depending upon the point of view)—is *Agave americana*, the century plant, which has blue-green leaves to 6 feet long with hooked spines along the edges and a wicked spine at the tip.

Agaves are indigenous to North America and are widely distributed, ranging from Utah in the north to Central America and the West Indies in the south, with the bulk of the population centering in Mexico. They occur from sea level to the tops of the higher mountains at elevations of 7000 to 8000 feet. In the desert areas they may receive only about 5 inches of rain annually, while the mountainous varieties may get as much as 30 inches per year. In Sonora they grow mainly on the rocky slopes of hills and mountains; they prefer a limestone soil, but seem to grow equally well in almost any well drained soil. They thrive in full sun.

They range in size from the choice, diminutive *A. pumila* with leaves up to 4 inches long and *A. filifera* var. *compacta* (a large one is only 6 inches in diameter) to the massive *A. atrovirens* and *A. americana*, with the larger species producing an inflorescence which may reach 35 feet in height. Agave plants require a number of years to store up sufficient food for the production of the spectacular flower stalk which grows with amazing rapidity once it emerges from the center of the plant. With the exception of *A. parviflora*, another miniature, the blooming of an agave plant signals its approaching demise. Under favorable conditions the average life



AGAVE ATTENUATA
Drawing by IRINA GRONBORG

SEVERAL DIFFERENT AGAVE SPECIES APPEAR IN THIS PHOTO OF A PART OF THE AGAVE GARDEN WHICH IS LOCATED ACROSS PARK BOULEVARD FROM THE SAN DIEGO ZOO.



cycle of an agave is 10 to 15 years, contrary to the popular myth that one may live 100 years before flowering and dying (hence the common name century plant). In most cases this is no irretrievable loss since the parent plant usually puts out dozens of offsets or suckers before this occurs. However, some agaves remain solitary such as the giant-sized *A. vilmoriniana* and the medium-sized, mature *A. victoriae-reginae* (it can have offsets when young). In these instances propagation must be from seed or bulbils in the inflorescence. The flowers are generally various shades of yellow, although they may also be green, and occasionally purple, or red. Bats and hummingbirds are among the possible pollinators.

In hardness they range from the tender, tropical species of the West Indies and Central America to those withstanding the subzero temperatures of the high plateaus of Mexico and the more northern latitudes of the United States. Because of their tender tropical nature few, if any, of the agaves native to the West Indies are cultivated in California.

Agaves are among the most ferocious of all succulent plants, most of them being armed with needle-sharp teeth along the leaf margins and a vicious terminal spine at the tip. However, there are a few soft-leaved and relatively harmless varieties such as the familiar *A. attenuata* with its beautiful inflorescence of greenish yellow flowers on a gracefully arching 10-foot spike. *A. vilmoriniana*, and a group having highly decorative curly threads or hairs along the leaf margins as well as attractive white markings (*A. filifera*, *A. schidigera*, *A. parviflora*). In addition, there are several species, such as *A. falcata*, *A. striata*, and *A. stricta*, which have extremely narrow leaves 18 to 14 inches long, and lack teeth along the margins but possess a



THE BLOOMSTALK OF AGAVE ATTENUATA ALWAYS LEANS OVER TO FORM A GRACEFUL ARCH.

highly dangerous spine at the tip.

Although it is easy to confuse agaves with the genus *Aloe* belonging to the family Liliaceae, the resemblance is actually only superficial. The tough fibrous leaves of the agaves are quite distinct from the soft, pulpy, highly succulent leaves of the aloes, and of course the inflorescences are totally different. This is yet another example of parallel development; the agaves are to the Western Hemisphere what the aloes are to the East.

Much has been written about the economic and practical utilizations of agaves, which include the production of food, drink, soap, clothing, brushes, rope and other fibers, needles, thread, paper, glue, weapons, military instruments, medicines, red dyes, and animal forage. Some of the larger agaves are called mescal because of a potent alcoholic beverage of that name which is distilled from the fermented sap of the bud stalks. Tequila, the famous native drink of Mexico, is also distilled from fermented agave juices, and the beer-like pulque has a similar derivation. In 1971 the Department of Health, Education, and Welfare conducted a survey exploring cancer-inhibiting constituents in plants, including agaves.

Many animals get food, drink, and shelter from agaves. They are generally beneficial to wildlife (although their vicious teeth and bitter toxins repel most animals), and in many places their presence may be crucial to the survival of some animal populations such as bighorn sheep, deer, pack rats, kangaroo rats, and ground squirrels.

Pests and diseases are few, but in the wild, pocket gophers can be very damaging; they tunnel up through the base of a plant and eat out the central meristematic tissue. Borers may also damage plants in much the same manner, eventually killing them. Agaves are remarkably free of the usual plant diseases with the exception of a fungus disease which may attack them in very humid climates.

Related genera include *Yucca*, *Nolina*, *Dasy-lirion*, *Manfreda*, and *Hesperaloe*.

Agaves add interest and character to any home garden, large or small. Do not be frightened by the size of the century plant, there are many much smaller, even miniature ones, that have unusual leaf growth patterns and tall flower spikes that will be interesting and even beautiful.

References: Breitung, August J. *The Agaves*
Chidamian, Claude *The Book of Cacti & Other Succulents*
Dodge, Natt N. *Flowers of the Southwest Deserts*
Gentry, Howard S. *The Agave Family in Sonora*

Dorothy Dunn is a cacti propagator for a speciality nursery in Oceanside, California. She writes a "Plant of the Month" article for both the Palomar and San Diego Cactus & Succulent Societies.



THE BLOOMSTALK OF AGAVE AMERICANA SHOOTS UP TO 40 FEET.

SOME MINIATURE AGAVES AND THEIR CULTURE

LEROY N. PHELPS

Photos by BILL GUNTHER

OFTEN REFERRED TO as miniature century plants, the miniature agaves are loosely defined as those which are less than 18 inches in diameter at maturity when grown in the ground. Some of the larger agaves can be kept under this diameter when grown in pots. For practical purposes, I consider any agave that will grow in a 12-inch pot a miniature, even though the leaves may overlap the edges of the pot. I collect agaves because of their fantastic forms, not for the flowers. Some of the agaves will flower when grown in pots, but only after many years, and flowering signals the death of the plant in most cases. There are no common names for the individual agaves.

The smallest known agave is *Agave parviflora*, a native of Arizona and Sonora. The adult plant has leaves about 4 inches long arranged in a spiral rosette (as do all agaves) 4 or 5 inches in diameter. The leaves are less than one-half inch wide, are bright green and have white markings on them with white threads along the edges. This agave is also famous because it does not die immediately after flowering. The plant produces pups very near the base only after flowering, which occurs in 7 to 10 years. The mother plant will generally survive 4 or more years after flowering but does not grow any more. It does not flower a second time. The flower spike on this species is about 3 feet tall, unbranched, and has a profusion of petal-less flowers with rusty colored stamens. I have flowered this plant in a pot 4 inches wide and 3 inches deep, but it does look better in a larger pot. A few agaves other than this one may survive for several years after flowering, but it is a rare and inconsistent phenomenon for them.

Very closely related to *A. parviflora* is *A. polianthiflora*, also from Arizona. Except for a slightly larger size, the plants look identical. However, stand back when it flowers! This is the only red-flowered agave known, and the flower does have petals.

The most famous miniature agave is *A. pumila*, still referred to as the smallest of all agaves by most authors. This is a myth! I know of several plants over 2 feet in diameter, and I have one in a pot that is 18 inches in diameter. Since its introduction to Europe



AGAVE PUMILA, IN ITS JUVENILE FORM, HAS LEAVES DECORATED ON BOTH SIDES WITH ATTRACTIVE DASH-MARKS. THE THUMB AT RIGHT PROVIDES SIZE PERSPECTIVE.

well over 100 years ago from Mexico (locale unknown and never rediscovered) this agave has commanded very high prices. In the early days these plants were considered to be more valuable than their weight in gold. The major reason for considering this plant to be a microminiature is that it has a juvenile form different from the mature form—unique among the agaves. The juvenile form has a maximum of about 8 leaves at a time, as wide as they are long and very strongly cupped. There may be a few weak teeth on the edges and there are many dark streaks on the underside. The leaves tend to be a gray-green in color. This form may be maintained until death of the plant when kept in a small pot. If regularly potted up the plant will develop much longer leaves, still somewhat cupped, and will have very few streaks on the reverse. The teeth will become much more prominent. It is difficult to realize these two plants are the same, even when they are side by side. The juvenile form of *A. pumila* may pup, but this is not common. The mature form is not known to pup at all. Popping can be forced, sometimes, by slashing the crown of the juvenile form with

a long sharp knife (the growing point of the plant must be destroyed). This, of course, destroys the beauty of the plant; but frequently several pups are formed. It will probably always remain quite rare.

An exciting true miniature that was discovered (created?) in Japan just a few years ago is *Agave potatorum* var. *verschaffeltii* forma *minima* (sorry about that!) with a Japanese name I have unfortunately lost. This plant has flat, heavily toothed leaves up to 2 inches wide and long. It pups heavily at each leaf base and forms a cluster 6 inches or more in diameter in a couple of years. The only way to remove these pups is to uproot the plant and peel leaves and pups off—not a thing one wants to do frequently. These plants remain in somewhat short supply as a result. As with all agaves, I grow this one in well-drained soil (50%) pumice in a pot wider than deep. It is a truly beautiful plant, and the only agave in my experience which prefers partial shade.

The most beautiful agave to me is a variety of the Queen Victoria agave, *A. victoriae-reginae* var. *ornatum*. The species grows to over 18 inches in diameter and has dark green leaves with narrow white markings. This variety grows very slowly to about 9 inches in diameter, has lighter green leaves and the white markings are wide and profuse. The leaves tend to curl in towards the top forming a ball effect. This plant, as will all the varieties of the species, pups only when young (the first 3 or 4 years). The species will flower between 15 and 20 years of age, but no one knows the age of flowering of this variety (I have a plant in the ground that is now over 15 years old). This agave is the most sensitive I have to over-potting—I found this out with pups I attempted to grow too fast and lost.

Another attractive miniature with white markings and white threads on the leaves is *A. filifera* var. *compacta*. Its leaves are generally about 3 times as long as wide in a large plant with the rosette a maximum of about 6 inches in diameter. The leaves are a rich dark green and quite flat. This plant may form pups, but they are usually few. In my experience this is one of the most sensitive to overwatering of any of the agaves.

A very different appearing miniature is *A. echinoides* (which may not be a true species). It gets to about 6 inches in diameter and pups heavily close to the base. The leaves are very slender and upright to about 6 inches long. They are light green in color, have no teeth, and are striated. The spines on these

leaves are slender and extremely sharp. I am reminded of a porcupine whenever I look at this plant.

There are probably over twenty other agaves that fit into the miniature classification, but, unfortunately, many of them are unnamed species. I may be able to classify them someday if they should flower. These plants are further variations on descriptions already given. There are extremely slender leaves and extremely heavy leaves, leaves without teeth and leaves with teeth that would do a shark proud, and leaves that are perfectly straight and leaves that are quite twisted.



AGAVE VICTORIAE-REGINAE VAR. ORNATUM, FROM MEXICO, SPORTS BEAUTIFUL WHITE LINEAL MARKINGS ON ALL ITS LEAVES. THE PENNY AT LOWER RIGHT PROVIDES SIZE PERSPECTIVE.

Summarizing my culture, I generally use a shallow pot that is 1 or 2 inches greater in diameter than the rosette. I use a well drained soil mix (50% pumice). Although not necessary, I use gravel as a top dressing strictly for appearance. In the North Park area of San Diego I have all the agaves in full sun except for *A. verschaffeltii minima*. I report when the leaves begin to overlap the edge of the pot except for the larger ones which are allowed to overlap. These large ones are repotted only when the root mass pushes the plant out of the pot. I usually repot in the spring, but they do not seem to mind it any time of the year. I usually cut the roots back severely (to about 3 inches), remove all dead leaves from the base, put the plant back in the soil, and water immediately. Although most succulent plants should be dried for a week or more when roots are damaged, the agaves will be retarded in rooting if



AGAVE FILIFERA VAR. *COMPACTA*, WITH LEAVES ONLY FOUR INCHES LONG, IS A DWARF FORM OF THE SPECIES WHICH TYPICALLY HAS LEAVES UP TO TWENTY INCHES LONG.

dried. I water about once a week year-round (except when its been raining), but find the agaves are forgiving of either under- or over-watering. The general practice of sticking one's finger into the soil to check for need of water is discouraged since the spines and teeth of the agaves will frequently grab unwary fingers!

Dr. Phelps, Associate Professor of Microbiology at San Diego State University, has been growing cacti and succulents for about 17 years, and started his collection of miniature agaves a few years later. He is a member of the San Diego Cactus & Succulent Society and the Cactus & Succulent Society of America.

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CLIVIA ARRANGEMENT

BY

Adrienne Green



Clivia miniata

Dried giant bird-of-paradise, *Strelitzia nicolai*, foliage.

Container by SHIRLEE KIMSEY
Photo by WILLIAM GREEN

TRICKY LITTLE TRICHOMES

CAROL GREENTREE

Photos and drawings by CAROL GREENTREE

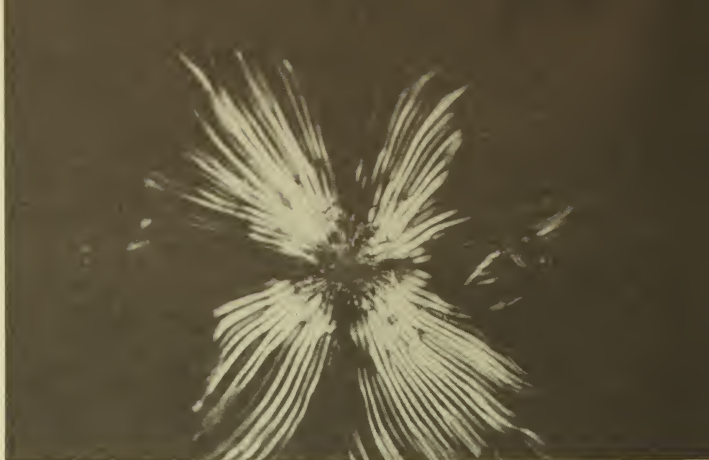


PHOTO B
A PELTATE SCALE RESEMBLES A FANTASY FLOWER IN THIS MICROPHOTOGRAPH OF AN *ELAEOAGNUS PUNGENS* TRICHOME.

USEFUL CELL MODIFICATIONS THAT ADD INTEREST TO ORNAMENTAL PLANTS

Felty. Fuzzy. Fragrant. Many of your favorite garden plants may have leaves that are scratchy or softly furry or aromatic. Perhaps some foliage has a silvery sheen or velvety texture that appeals to your aesthetic sensibilities. Or it may have an elusive pungence that drifts from a sunny place in your patio and delights your sense of smell.

You may have chosen dozens of house and garden plants for their attractive leaf textures and novelty colorations. These qualities are often characterized by small hairs or glands—too tiny, perhaps, for the eye to discern—that give your fingertips or nose a special treat.

Botanists call these fascinating epidermal adaptations trichomes. (Pronounced try-komes). They usually have insured the plant's survival in the earth's evolutionary competitions. Some aid the entrapment and absorption of humidity. Others create life-saving microclimates over the surface of a leaf. They may shade a leaf from hot and desiccating sun or provide an envelope of moisture next to tender areas. The glandular secretions of some plants are toxic to predators. The fine barbs of other plants prevent insects from feeding or laying eggs on any plant part.

Trichomes can be pigment-laden, as in the arresting velour of the purple velvet plant, *Cynura aurantiaca*. They can be light-scattering reflectors, as in the shiny silver tree, *Leucodendron argenteum*.

In the garden such plants add appealing touches of color and texture to your landscape. Under a microscope their outer cell modifications reveal elaborate cuticle geographies, like miniature lunar landscapes or tiny underwater fantasy worlds. (See Figure 1).

Trichomes can be simple or complex. Their type, density and arrangement yield a whole vocabulary of descriptive terminology. Hairs can be arachnoid, or spiderlike; dendroid, or tree-like; floccose, or woolly; sericeous, or silky. Scales can be peltate, or shield-shaped; farinose, or mealy; lepidote, or mica-like;

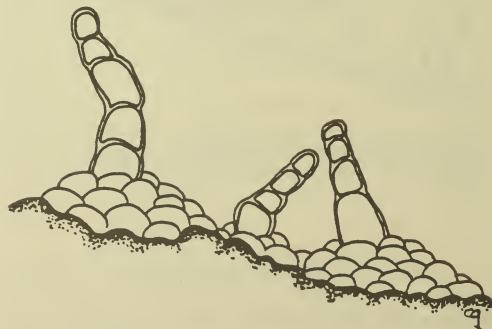


FIGURE 1
SEVERAL-CELLED PLANT HAIRS LOOK LIKE EXTRA-PLANETARY PROBES IN A MAGNIFIED VIEW OF *CHRYSANTHEMUM* SP. FILAMENTS.

squamose, or very scaly. Glands can be capitate, or headed; papillose, or nipple-like; uncinat, or hooked. (See Figs. 2 & 3 and photo B). Many of these names are used to identify the plant taxonomically.



FIGURE 2
STALKED GLANDS, MULTICELLULAR HAIRS AND OTHER KINDS
OF TRICHOMES TEXTURE BOTH SIDES OF A *GAZANIA* SP. LEAF.

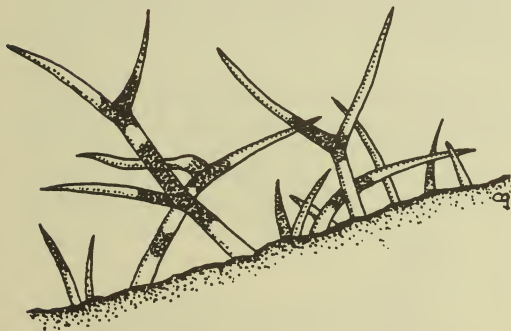


FIGURE 3
MULTICELLED DENDROID TRICHOMES OF *PLATANUS*
RACEMOSA ILLUSTRATE A SIMPLE BRANCHING OR TREE-LIKE
HABIT.

Trichomes are especially abundant in xerophytes—plants adapted to dry places. Botanists speculate that dense hairs or scales on plant parts have helped such vegetation tolerate extremes of heat and dryness. The more xeric the conditions, the more tomentose, or hairy, the outer cells. Researchers believe this

pubescence relates directly to water economies, insulating the vulnerable outer layer of the plant from moisture loss.

They may also help cool the plant. You can test this idea yourself, the next time you visit the desert. Feel the leaves of various plants. They will be noticeably cooler than the air temperature.

In bromeliads, trichome structures range from simple multicellular hairs to stalked shield-like forms. *Tillandsia* scales possess a hydrophillic substance that is actually able to hoard water in each absorbent trichome. Thus dew and humid air can supply sufficient moisture for epiphytes without conventional roots. (See Fig. 4).

Some trichomes may extrude substances that

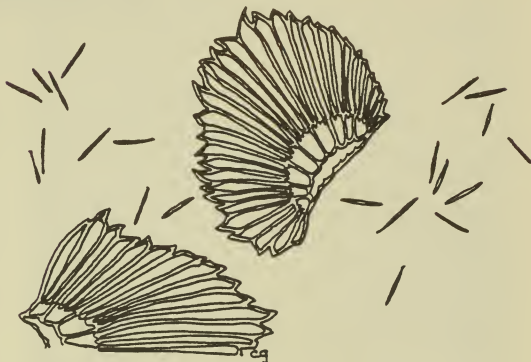


FIGURE 4
SCATTERED NEEDLE-LIKE CRYSTALS, OR RAPHIDES, SPILL
FROM THE FISH-FIN LIKE SCALES OF *TILLANDSIA* SP. SUCH
SCALES ACT AS STORAGE UNITS FOR A VARIETY OF PLANT
SUBSTANCES.

would be harmful if they remained in the plant. *Atriplex*, a halophyte from salty areas, is capable of secreting salt-laden fluids through specialized glands. This adaptation permits survival in chemically harsh areas such as desert and seacoast locations.

Trichomes serve in some cases as storage or excretory tissue for resins, enzymes, and starch grains. Mints, sages, rockroses, and camphor leaves are aromatic examples. Evidence also exists that hormones and wound-healing substances are stored in trichomes until they are needed.

In some species trichomes may enhance the energy efficiency of a plant. Absorption of solar radiation is apparently affected by canescence (grey pubescence), which can reduce the impact of strong

sunlight as much as fifteen percent on the hairy upper-sides of leaves. Peltate trichomes may act as little parasols, shading tender cells from heat and dry air. In the desert you may have noticed the subtle, monochromatic effect of the many silver- and grey-leaved plants in the natural landscape. The lighter colors of trichome-protected plants increase their reflective capabilities. Whitish-leaved garden examples are yarrows, dusty millers, and cushion bush.

Studies have shown that plants with small, fuzzy leaves are less vulnerable to blights. This may be due to the wick-like quick drying afforded by tiny plant hairs. The result is a surface too dry to support the development of pathogens.

Bristly, coarse trichomes may make insect travel difficult and create an environment that is inhospitable as a bug nursery. *Fremontodendron*, for instance, has velcro-like stellate (star-shaped) hairs



PHOTO A
A SCATTERING OF HAIRS ON A CROSS-SECTION OF
FREMONTODENDRON SP. LEAF ILLUSTRATES THE
COMMANDO-BARRIER EFFECT OF TRICHOMES THAT
DEFEND CERTAIN PLANTS FROM PREDATORS.

that would discourage any small intruder. (See Photo A). Young, tender plant parts are more likely to be woolly than older tissues, which may be tougher and better defended against pests and diseases.

Glandular secretions of some plants are toxic to predators. Stinging nettle has a chemical defense you may have experienced yourself, and so does poison oak.

Trichomes offer a wide range of benefits to plants. . . from simple, direct functions to intricate, complex processes. Some families, such as Caprifoliaceae and Acanthaceae, have a wide spectrum of diversity in trichome forms. Many plants have

several different kinds of trichomes on each leaf. . . veritable mini-thickets of specialized filaments and protuberances.

You probably have trichomes to thank for the foliage hues and tactile features of natives and other ornamentals. Trichomes make a plant more than just pretty. They may be the very reason you can count on it to perform so well for you when the weather is too hot for comfort. . . or when you want to sneak away for a vacation. . . or when water becomes a scarce and costly resource.

For fun, the next time you see a trichome-laden plant, get out your 10x hand lens and take a moment to inspect its surface in detail. Let it reveal its little secrets to you. And marvel at the not-so-mysterious qualities that make it such a worthwhile specimen in your garden.

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A PLANT FOR CHILDREN

Text and photos by BILL GUNTHER

WOULD YOU LIKE to stimulate some small child to become interested and involved with plants? If so, let the swan plant help you achieve your objective. Little children fall in love with it. (So do adults.)

The swan plant is almost unknown in southern California, but in some other parts of the world it is so familiar that it has five different popular names: swan plant, milkweed, butterfly plant, silkweed, and pleurisy root.

It is called the swan plant because it bears many inflated seed pods, resembling golf balls in size and color, but so light that they float on water like swans and because the pods later open to release seeds that fly away with the wind on flossy parachutes which resemble swan's down. This double-feature swan resemblance alone is sufficient to entice any young child to take an interest in the swan plant. But to further enhance its attractiveness, the plant offers additional interesting features.

If a child breaks off a stem of this plant, white milk-like juice appears at the wound; that is why it is called milkweed. When it is in bloom it attracts hundreds of butterflies of many species; that is why it is called butterfly plant. When the seed pod first opens, the contents look like a ball of white silk, which is why it is called silkweed. It is called pleurisy root because many generations ago medical practitioners prescribed the root of this plant as a treatment for a then-prevalent and frequently fatal disease called pleurisy (usually it actually was tuberculosis).

The botanic name of this plant is *Asclepias physocarpa*. It is native to South Africa which has a climate so similar to that of southern California that the plant performs beautifully here with no need of any special care.

The swan plant is a perennial; it grows up to 6 feet tall. It has deep tap-roots and therefore is drought-resistant, but because of the deep tap roots it cannot be easily transplanted. Accordingly, it should be grown from seed planted in the location in which it is to grow to maturity. It is so versatile that it performs equally well in full sun or partial shade, and it performs equally well in rich soil or poor soil. Fungus



SOFT HAIRS PROTRUDE FROM THE SKIN OF THE UNOPENED SWAN PLANT POD AT TOP. AT CENTER, THE SKIN OF A POD HAS POPPED OFF, EXPOSING THE INDIVIDUAL SEEDS AND THE SILKEN WINGS WHICH ALLOW THEM TO FLY WITH THE WIND. THE HUMAN HAND PROVIDES SIZE PERSPECTIVE.

and insect pests do not bother it, but butterflies love it.

If it has all these desirable attributes, why then is the swan plant practically unknown in southern California gardens? The reason is that it is unavailable. No southern California nursery sells plants of this species; seeds of it are not available on local seed display racks, and no popular mail-order seed catalogue lists it.

So then how is it possible to get swan plants for you, and your children, to enjoy?



THE SPHERICAL SEED PODS OF THE SWAN PLANT ARE ATTRACTIVE IN A CHILD'S WHIMSICAL WATER-GARDEN ARRANGEMENT. A CERAMIC FROG (UNDER A CANOPY OF FERNS, A JAPANESE IRIS BLOSSOM, AND A BLOOM-STALK WITH FOLIAGE OF WATER HYACINTH) FIDDLES A SERENADE TO FOUR OF THE HIGH-FLOATING "SWANS."

The answer is simple. Just send a mailing envelope, pre-stamped and pre-addressed to yourself, to *California Garden Magazine*, Casa del Prado, Balboa Park, San Diego, CA 92101. You will receive a dozen swan plant seeds together with planting instructions (as long as the supply lasts); a free gift to you from *California Garden* magazine and the San Diego Floral Association.

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THE LOWLY RADISH

ROSALIE GARCIA

Drawings by IRINA GRONBORG

WHOEVER HEARS ANYONE bragging about the fine radishes he grows? They are kid stuff. Scatter a few seeds in almost any kind of soil and in three weeks there are little red balls, crunchy and sweet, ready to eat. That is, if one plants the common 'Cherry Belle,' which is round firm solid and sweet, and the chief market variety. That sweet and crunchy stage lasts less than a week, and that is the catch. After that, the flesh becomes a hot pith that can rival a mild pepper.

Like so many of our favorite vegetables the radish, *Raphanus sativus*, is a cool weather vegetable. It loves our Pacific Coast where we can grow at least some variety at any time. But the fast maturity rate makes it one that lends itself to small and frequent plantings. Raised beds, window boxes, even flower pots will produce plenty for the salad bowl, and the tender young tops give a spicy tang to a tossed salad.

The market staple, the hardy little 'Cherry Belle' is not the only one or the best, for there are others. My favorite is the 'French Breakfast,' which is a little larger and longer, red and white, but mild and sweet, and not so prone to pithiness. Many people would not choose a radish to accompany bacon or ham and eggs, but try a few of these delectable morsels and see.

In addition to the 'Cherry Belle' and 'French Breakfast' one may have long red and white, yellow and purple, and even black radishes. They can be slim, short, stocky, hot, and early, mid-season, and fall maturing. In southern California, the best ones are grown in our winter and spring months.

We Americans are not really radish eaters like the Japanese. We do not pickle them, sweet and sour, but confine them to the salad bowl or hors d'oeuvre platter. Little children like the crunchy texture, but one that is hot will discourage them, as it should, for they are one of the more indigestible foods. As my small niece used to say they gave her the "hick cubbies" (hicoughs).

Seldom does one find a gardener who is a

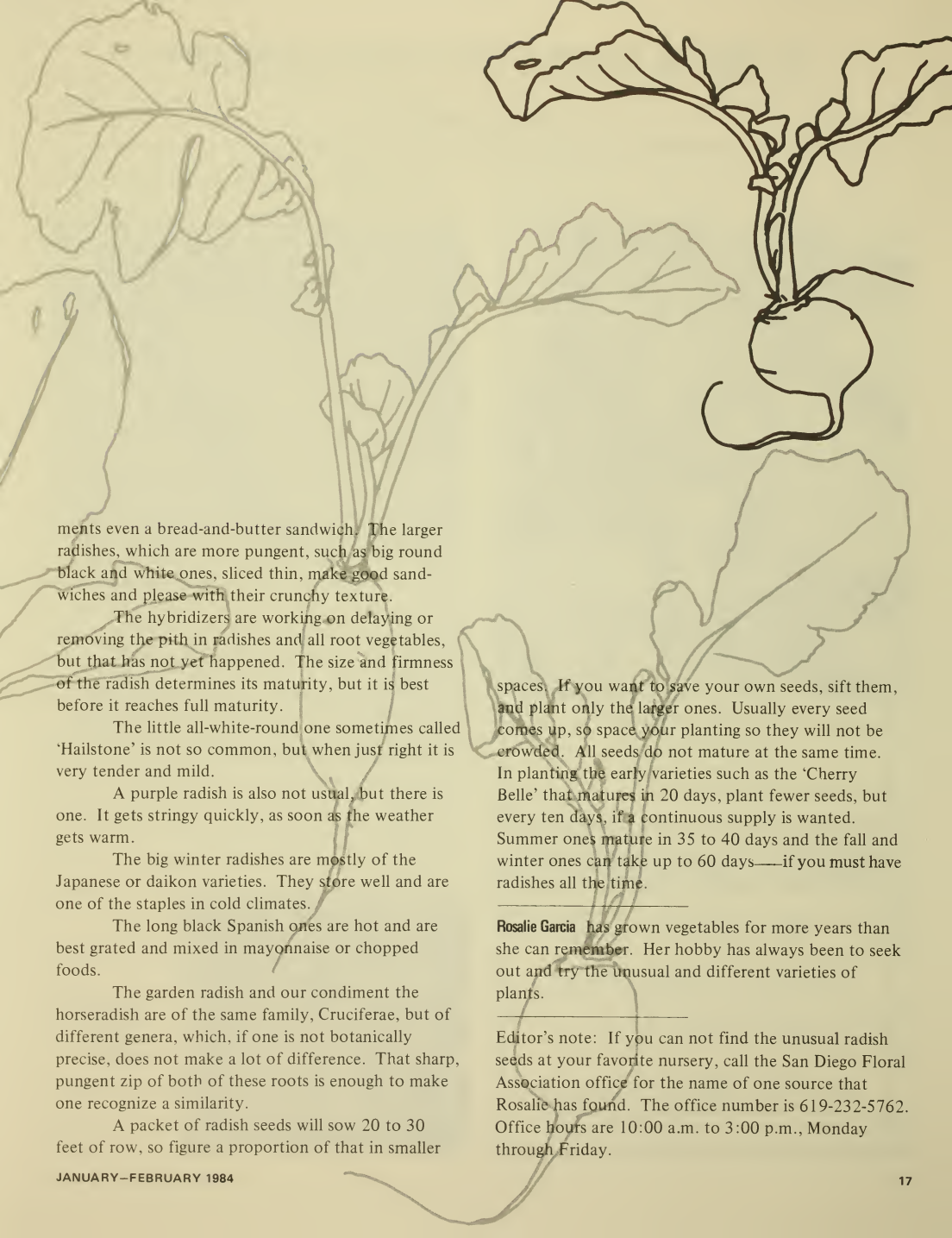
radish specialist, but if he is, he delights in the Japanese varieties. Many of them are strong of flavor and hot. They are usually planted in the fall to mature in winter. Some of them take more than two months to mature and they stand colder temperatures, even freezing.

In buying seeds, note planting and maturity periods. When preparing the soil, think of their root systems. Some of them reach 6 to 12 inches and they need a loose, alluvial soil with enough humus to keep it from packing. In small spaces such as window boxes and pots, when one plant is pulled out, drop in a few seeds for a continuous crop, especially of the quick growing 'Cherry Belle' and 'Sparkler' (white base and red top).

The radish is not new. We still have a wild variety blooming in our meadows and fields to this day. The ancient people of the Mediterranean countries, Greece, and Rome, and before them the people of China and Japan knew radishes. There is no record of who cultivated them first. Maybe the ancient people did not know they have practically no food value, and they never heard they were high in vitamin C, but they grew them, ate them, pickled them, and served them at their feasts. Why?

The small varieties grow and mature in three weeks. They lend texture and piquancy to salads, soups, and make contrasts to soft, or greasy foods. Radish roses from the 'Cherry Belles' are decorative and lend a festive note to a meal. The long red and white ones complement a cocktail table and add some "bite" to food accompanying the drinks. In this way they get into "High Society" with a flair.

In the present climate of "no sweets," the radish, in a small way, takes their place; it comple-



ments even a bread-and-butter sandwich. The larger radishes, which are more pungent, such as big round black and white ones, sliced thin, make good sandwiches and please with their crunchy texture.

The hybridizers are working on delaying or removing the pith in radishes and all root vegetables, but that has not yet happened. The size and firmness of the radish determines its maturity, but it is best before it reaches full maturity.

The little all-white-round one sometimes called 'Hailstone' is not so common, but when just right it is very tender and mild.

A purple radish is also not usual, but there is one. It gets stringy quickly, as soon as the weather gets warm.

The big winter radishes are mostly of the Japanese or daikon varieties. They store well and are one of the staples in cold climates.

The long black Spanish ones are hot and are best grated and mixed in mayonnaise or chopped foods.

The garden radish and our condiment the horseradish are of the same family, Cruciferae, but of different genera, which, if one is not botanically precise, does not make a lot of difference. That sharp, pungent zip of both of these roots is enough to make one recognize a similarity.

A packet of radish seeds will sow 20 to 30 feet of row, so figure a proportion of that in smaller

spaces. If you want to save your own seeds, sift them, and plant only the larger ones. Usually every seed comes up, so space your planting so they will not be crowded. All seeds do not mature at the same time. In planting the early varieties such as the 'Cherry Belle' that matures in 20 days, plant fewer seeds, but every ten days, if a continuous supply is wanted. Summer ones mature in 35 to 40 days and the fall and winter ones can take up to 60 days—if you must have radishes all the time.

Rosalie Garcia has grown vegetables for more years than she can remember. Her hobby has always been to seek out and try the unusual and different varieties of plants.

Editor's note: If you can not find the unusual radish seeds at your favorite nursery, call the San Diego Floral Association office for the name of one source that Rosalie has found. The office number is 619-232-5762. Office hours are 10:00 a.m. to 3:00 p.m., Monday through Friday.

IS THERE A COTONEASTER IN YOUR LANDSCAPE?

SHARON SIEGAN

Photos courtesy New York Botanical Garden *Illustrated Encyclopedia Horticulture*



COTONEASTER SALICIFOLIUS FLOCCOSUS (FRUITS)

LIKE TOYONS AND pyracanthas, cotoneaster (ko-tō-née-ás-ter) add a bright note to many southern California neighborhoods. Scarlet berried, they usher in the autumn, with the colorful leaves of the deciduous varieties reminding transplanted Easterners of winters that will come no more. Thornless, they can be readily distinguished from pyracantha. But their major attraction is their amazing versatility.

Cotoneasters come in myriad form: their growth habits range from low creepers to bush to small tree. Depending on the species, any of these forms are available in deciduous, semideciduous, or evergreen type.

No wonder then, that cotoneasters lend themselves to such diverse use as ground cover, decorative espalier, bank plantings, screening hedge, container plant, and specimen tree. The decorative berries are a

bonus that attracts many birds to the garden. Several species such as *Cotoneaster multiflorus*, *C. frigidus*, *C. salicifolius*, *C. glaucophyllus* forma *serotinus*, and *C. hupehensis* are valued as flowering shrubs. Blooms are white to pink, and long-lasting.

Most cotoneasters are fast growing and drought resistant. Pruning is primarily confined to thinning out the rather sprawling, widespread forms. And plantings generally succeed with minimum attention—even preferring poor, dry soil, where they will flower and berry profusely.

With such virtues, why not plant a variety of cotoneasters to fill your gardening needs? You can, and many do. But there is a caution. Cotoneasters are a member of the rose family (Rosaceae) and as such, are subject to fire blight (see article on page 20 *All About Fire Flight*). Once started, unless carefully pruned far back (at least 6 inches) into healthy wood, this very infectious bacterial disease will quickly waste the plant. The bacteria are transmitted by insects, such as bees and flies, feeding on the flowers during moist spring weather. Curiously, cotoneaster does not require insects for pollination. These plants engage in apomixis, which allows them to set seeds asexually without external fertilization.



COTONEASTER DAMMERI RADICANS (FLOWERS)

Sometimes called rock spray, *C. horizontalis* is a popular choice for espaliering against a wall, or simply sprawling over a rock garden or embankment. Although it is considered deciduous to semi-deciduous, in the San Diego climate it remains leafless for only a matter of weeks. This 2 to 3 foot tall species will bear crimson leaves just before they drop, and afterwards,



COTONEASTER ADPRESSUS PRAECOX, IN FRUIT

the bright red berries remain on the branches. Like all cotoneasters, the growth habit is expansive, so allow ample space. For a white leaf edge, try *C.h.* 'Variegatus.'

Cotoneasters are especially attractive as a ground cover, but avoid planting near a walk or driveway, as the cut tips of branches are blunted and unattractive. For such use, consider *C. dammeri*, an evergreen trailer whose rooting branches are prostrate, reaching an elevation of only 3 to 6 inches. With a spread of up to 10 feet, this vigorous plant is also an excellent candidate for carpeting rocks or cascading down walls. Cotoneaster makes a handsome ground cover when combined with juniper.

Slow growing *C. adpressus* has a softer, less rigid look, and stays below one foot in height. In contrast, *C. 'Lowfast,'* true to its name, spreads about 2 feet per year until achieving its maximum coverage of about 15 feet, but it too is less than 1 foot tall. Both are evergreen.

Suppose you are seeking a hedge or screen. Cotoneasters provide many possibilities. *C. glaucophyllus* is a handsome evergreen bush of arching form, measuring about 6 by 6 feet which can be pruned as desired.

A deciduous, informal hedge is created by *C. divaricatus*, whose central radiating branches are stiff, and thickly covered by colorful leaves in autumn. Silverleaf, or *C. pannosus*, is a tall evergreen (about 10 by 10 feet) that serves well as a windscreens. Leaves along the arching branches are white felted beneath greyed tops. Many other choices are available, about which you may want to consult your nurseryman.

Although less popular, cotoneasters do make striking small trees. Evergreen *C. franchetii*, will grow into an attractive multi-stemmed tree with arching limbs. Thin, but do not shear, to avoid stubby ends.

Another tree choice is *C. salicifolius*, or willow-leaf. This is a partially deciduous species whose wrinkled leaves turn ruddy before shedding. Give it lots of space—the high, fountain-like branches will fan out 15 to 18 feet in diameter. Because the seasonally bare branches look best against an architectural background, this should be treated as a specimen tree.

I have reported on only a scattering of the more than fifty species of cotoneaster available. Hopefully, you are checking your own landscaping needs to find a suitable place for one, whose name, derived from the Latin *cotonea* and suffix *aster*, translates into a "lesser quince."

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ALL ABOUT FIRE BLIGHT

STUART MACDONALD

ONE OF THE most common and destructive diseases of plants in the rose family (Rosaceae) is fire blight. This bacterial disease causes tender shoots and blossoms to suddenly wilt, then shrivel and blacken. This burned appearance gives the condition its name.

Pears and quinces are extremely susceptible. According to Vincent Lazaneo, San Diego County Farm Advisor, there are increasing problems in this area with fire blight on ornamental evergreen pear trees. At the time so many were planted a few years ago, it was thought they were immune to fire blight. Either they are not as resistant as it was first thought or the organism may have mutated.

Apples and pyracantha species are frequently damaged. Also, occasionally affected are cotoneaster (especially in the coastal area), spirea, toyon, photinia species, loquat, and other related species. Some of the native plants, ceanothus in particular, are affected.

SYMPTOMS

Watch for the wilting of blossoms, young fruit, and tender shoots that soon blacken and look as though they were scorched by fire. After an infection starts it may progress down into the bark of larger limbs where dark, sunken cankers appear. These cankers grow larger and may even encircle the limb.

DISEASE CYCLE

The bacterium *Erwinia amylovora* that causes the disease lives and multiplies through most of the year in blighted twigs and cankers. During early spring a sticky fluid containing the bacteria oozes from the cankers in small, milky, drops. This attracts a variety of insects, including bees and flies. The bacteria are carried by insects and splashing rain to blossoms and tender parts of the plant. Fire blight may be spread from blossom to blossom by bees, but the bacteria do not live in beehives as a holdover sources.

CONTROL

For the home gardener the best advice is to be observant. As soon as symptoms are noticed (usually in early summer), prune out all infected twigs and



HAWTHORN TWIG INFECTED WITH FIRE BLIGHT.

branches. Cut well below the diseased area, as much as 6 inches, and 12 inches or more in larger limbs. After each cut, sterilize the cutting tools with rubbing alcohol or Lysol to prevent spreading the disease. Household bleach is not recommended because it is corrosive to most metals. Burn the diseased material or place it in a closed trash can or plastic bag.

Tender, succulent growth is most affected by fire blight, so avoid rich nitrogen fertilization and heavy irrigations that promotes excessive new growth. Development of the disease is favored by a combination of 70° to 85° F. temperatures and high humidity. It is more prevalent after a winter of heavy rainfall, which, if current predictions are correct, will be in store for southern California this year.

Commercial growers do use streptomycin and copper-containing sprays on the blossoms (pears primarily) for control. However, these sprays are not practical for the home gardener, according to Lazaneo. The sophisticated equipment necessary to apply the spray effectively is impractical for the home gardener.



Unfortunately, the only recourse for a severely infected plant is to remove it and replant.

To summarize: the best advice is to be observant, carefully remove and dispose of affected branches, do not overwater, and avoid overhead sprinkling of susceptible plants.

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AN EXPEDITION TO COLLECT LETTUCE

THOMAS W. WHITAKER & R. PROVVIDENTI

THIS IS THE CONCLUSION OF A SERIES OF THREE ARTICLES.

PART III

• GREECE

We left Izmir for Athens on June 27. We spent the next two days in Athens going through the usual diplomatic and political amenities. Some good did come from these exchanges of pleasantries. The American Consul arranged an itinerary to be followed in our collecting endeavors, and the Greek Minister of Agriculture offered to provide transportation and scientists to act as guides and interpreters. This offer was gratefully accepted, and gave a much needed boost to our diminishing budget.

Our main effort in Greece was directed toward the west coast of the Peloponnesus from the area around the port city of Patras south to Mithoni. We made our headquarters at the city of Pirgos. Pirgos is a medium-size city about mid-way between Patras and the tip of the peninsula at Methoni.

The west coast of the Peloponnesus supports a thriving agriculture. There are well-tended orchards of deciduous fruits, citrus, and olives. Muskmelons, watermelons, tomatoes and eggplant are common. Maize and sugar cane are among the field crops grown.

In this area we made a number of collections of "land races" of lettuce and several collections of wild lettuce. Also, we pointed out to our collaborators colonies of *Lactuca saligna* from which we desired seed. *Lactuca saligna* is closely related to cultivated lettuce. It has great potential for improving cultivated lettuce because it carries genes for resistance to cabbage loopers and downy mildew. We have demonstrated that *L. saligna* can be hybridized with garden lettuce, and individuals in the F_2 have some degree of self-fertility.

We terminated our collecting efforts in the Peloponnesus with a visit to the famous Olympic Village. It was here the Olympic games originated and were contested for centuries. The setting is a beautiful 5000 acre woodland. Among the broken and



MAP OF GREECE. NOTE THE TWO INDEPENDENT DOTTED LINES INDICATING THE ROUTES FOLLOWED BY THE COLLECTING EXPEDITION. THE FIRST PORTION OF THE TRIP CONCENTRATED ON THE WESTERN COAST OF THE PELOPONASUS FROM CORINTH AS FAR SOUTH AS METHONI. THE SECOND PART OF THE TRIP CONSISTED OF 2 SHORT FORAYS INTO THE COUNTRYSIDE FROM THE NORTHERN CITY OF THESSALONIKI.

scattered building blocks we found wild lettuce in the most unusual places.

We returned to Athens by bus, then travelled by plane to Thessaloniki (formerly Saloniki) for three days' collecting before returning to the United States. The Macedonian city of Thessaloniki is the second largest city in Greece. It is a modern city with many broad avenues and parks. Alexander the Great was a Macedonian, and this area served as a springboard for his conquest of the then known world.

We made two short trips to the north and south of Thessaloniki. The countryside reminds one



LACTUCA SALIGNA, A SPECIES OF WILD LETTUCE, GROWING ALONG THE ROADSIDE IN THE CREVICE BETWEEN THE ASPHALT PAYMENT AND STONE WALL—GREECE.

of the Middle West. There are vast fields of cereals, mostly wheat. Adjacent to the rivers vegetables are grown, along with such crops as cotton and potatoes. We made several collections of "land races" of lettuce, and in the villages and cities, we made a number of collections of wild lettuce.



A VIGOROUS PLANT OF *LACTUCA SATIVA* (WILD LETTUCE), GROWING IN THE CREVICE OF STONE BLOCKS FORMED BY THE RUINS OF A LARGE STRUCTURE—OLYMPIC VILLAGE, GREECE.

We are indebted to Dr. G. Apostolatos and his wife Marietta for their gracious hospitality during our visit to the Peloponnesus, and for their cheerful role as guides and interpreters. Dr. A. Zamanis acted in a similar capacity for our visit to northern Greece.

On July 7 we left Thessaloniki and returned to New York and Washington, D.C. via Athens.

With our collaborators we made a total of 192 collections of lettuce, 151 in Turkey, and 41 in Greece. Of the total collected, 108 items or about 56% were wild lettuce (*L. serriola*) or species closely related to lettuce. This material should give lettuce breeders much material for improving lettuce during the coming years.

Dr. Whitaker is Plant Geneticist, U.S. Department of Agriculture and Research Associate in Biology, University of California, San Diego Campus.

Dr. Provvidenti is the Senior Plant Pathologist, New York Agricultural Research Station, Geneva.

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LIVELY LIMITLESS LANTANAS

ALLETHE MACDONALD

LANTANAS, WITH SMALL flowers of “changeable” colors ranging from white through lemon-yellow, golden-yellow, and orange to deep red, are too often relegated to an area near the back fence. Cascading over a dry rock wall or in a hanging basket, the trailing or weeping lantana is distinctive. A standard-trained tree 3 to 3½ feet high makes a colorful accent for a patio or balcony. A hedge of orange-flowered plants or a planting of white ones in front of green shrubbery can be handsome and requires little water or care.

The lantana has been cultivated for so long that the species from which they originated is not known precisely. They are probably complex hybrids of species originally found growing in South America, Mexico, and the West Indies. It is possible that the Spaniards brought back the lantana, which they called *camaras*, from their colonizing expeditions. Botanists named the prominent species *Lantana camara*, and many garden lantanas are derived from it.

The Spaniards made lantana infusions to be taken as medicine or for use in baths for healing purposes. It is probable that European interest in the New World lantana was first excited by their reputed medicinal virtues. It is still used occasionally as a folk remedy in parts of the United States.

Lantanas, sometimes called shrub verberna, are hardy shrubs, trailing and bushy, and are perpetually flowering when kept active in the absence of frost. The thin woody, angled branches are hairy, sometimes prickly, with ovate to ovate-oblong leaves, usually wrinkled, with toothed edges sometimes tinged with red or purplish coloring. Small verberna-like flowers form 1- to 2-inch crowded, stalked clusters at the leaf axils or at the ends of branches. An odor from crushed foliage and flowers, disagreeable to many people, prevents them from being used often as cut flowers, but they provide bright cheerful color for almost any sunny location.

The wide-spreading bushy shrubs grow 3 to 5 feet tall and the dwarfed form grows from 1½ to 3 feet. The trailing forms are small downy spreading shrubs with vine-like pendant branches 3 to 6 feet or longer in length.

The old coarse upright species grows to 6 feet

and has naturalized. It grows wild from the southern United States to tropical America. In Hawaii this prickly, robust-growing type reaches a height of 20 feet, and has become an obnoxious weed in some agricultural areas. Plant hybridizers have used the species *L. camara* in development of many of the refined cultivars that do not grow out of bounds. These are found in the nurseries today. Following are some of the cultivars available in southern California:

- ‘Confetti’—A low spreading shrub 2 to 3 feet high by 6 feet. It comes in yellow, pink, or purple.
- ‘Spreading Sunset’—A spreading ground cover which grows to 2 feet high.
- ‘Spreading Sunshine’—A bright yellow and “Sunburst” a bright golden yellow. Both grow 2 to 3 feet high and 6 to 8 feet wide.
- ‘Trailing Purple’—A spreading ground cover which grows to 2 feet in height.
- ‘Radiation’—Grows 3 to 5 feet in height and width. This one, with rich orange-red flowers, may be trained as a patio tree.
- ‘Carnival’—(‘Dwarf Carnival’)—Is 1½ to 3 feet high by 4 feet wide. Flowers are pink, yellow, crimson, and lavender. (Usually is not available until spring and summer in the nurseries.)

CULTURE

Plant lantanas almost anywhere, but always in full sun in poor, well-drained soil. If the soil is too rich they grow too rank and do not bloom as profusely. Newly planted shrubs should be given plenty of moisture for a short time until they are well rooted. After that they need little water and will remain bright and attractive in the hottest weather.

Prune lantanas in early fall in frost-free areas for winter bloom, but wait until spring to prune in other areas.

Propagation is almost entirely by cuttings. Seeds

germinate easily but the seedlings are usually ungainly plants with inferior flower colors. Cuttings of young shoots (with a basal heel of old wood) should be made in late summer or early February or March.

Root the cuttings in sand, perlite, or vermiculite in a humid atmosphere. As soon as the roots are $\frac{1}{2}$ to 1 inch long, transplant the cuttings to small pots filled with sandy soil. Pinch out the tips when the plants are 3 to 4 inches high and repeat two or three times more.

When the plants are well-established, they may be moved outdoors if the weather is warm, or to larger pots for container-grown plants.

In colder climates lantanas may be used as summer bedding plants and lifted just before the first frost, to be kept over winter in a greenhouse or light area where the temperature is about 40° to 45° F.

In the San Diego area lantanas are attractive the year-round and will live for many years with little care. Occasionally, when there are frosts, the plant will die-back to the root crown. It is important that the plant not be trimmed or fed until the full 'dieing-back' is completed. Then all dead foliage should be removed. The plant will recover quickly and will reach its former size in about two years.

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Book Reviews

Review by SHARON SIEGAN

All these books are in the horticulture library,
San Diego Floral Association.

The Pruning Manual, Edwin F. Steffek. Van Nostrand Reinhold, 135 W. 50th St., New York, NY 10020, Second Revised Edition, 1982. Paperback \$4.95; cloth \$9.95.

This is an excellent, practical guide to pruning. Steffek explains procedures in the context of plant growth. The basics are the same for all plants, but intelligent pruning requires understanding the natural growth pattern for different kinds, and relating this to such pruning purposes as aesthetics, improved fruiting and flowering, health and rejuvenation. Steffek's approach is breezy; his information is sound and easily comprehended.

The manual is not confined to tree pruning; there are chapters on hedges, roses, groundcovers, dwarf and ornamental vines, plus fruit and nut trees. Additionally, he covers power tools, care and maintenance of all tools, and even offers tips on using the cut wood. Overall, this is a convenient helpmate for any gardener.

Growing Cyclamen, Gay Nightingale. Timber Press, P.O. Box 1632, Beaverton, OR 97075, 1982. \$17.95.

Gay Nightingale divides up the cyclamen world into the many wild species, known to few except the addicted collector, and *C. persicum*, the florist's cyclamen. *C. persicum*'s numerous strains and cultivars (many of them recent introductions), are extensively discussed and described. Availability of these silver leafed, frilly, striped and unusual colored blooms may pose a problem inasmuch as Nightingale covers the European market, which may or may not be representative of this country.

The chapters on cultivation and bloom period also refer to English growing conditions, perhaps further limiting the book's utility.

Nevertheless, the beautiful color plates, chapters on historical, geographical, and botanical development of the genus, along with such extras as poems about cyclamens and use of the flower in art, make this little transplant a pleasant addition to a horticultural library.

A Book of Cut Flowers, by Sheila Okun. A Quarto book, distributed in the U.S. by William Morrow & Co., Inc., 105 Madison Ave., New York, NY 10016, 1983. \$10.00.

This hard cover purse size volume is meant to assist the arranger in selecting seasonal florist materials. Arranged alphabetically by botanic name, with hand-

some full-page color illustrations by Mary Close, the well stocked florist wares are described. Each plant is further identified by common name(s) and family.

Hints on mechanics, color and flower-foliage combinations, along with odd bits of flower lore add up to a convenient reference for the flower shopper. Take it with you and ask for some of the unusual floral selections described.

A Floral ABC, by Elizabeth Cameron. Distributed by William Morrow & Co., Inc., for Quill, Fielding Publications, 105 Madison Ave., New York, NY 10016, 1983. \$7.95 F.P.T.

Superficially similar to the book of cut flowers reviewed above, this *Floral ABC* is less successful. Cameron is an accomplished British watercolorist, whose facsimile color illustrations for each of the 26 flowers alphabetically presented are completely charming. Unfortunately the accompanying text is less satisfactory. Written as a floral guide for her grandchildren, the tiny green script combined with occasional sophisticated botanical information seems demanding. Yet the potpourri of associations sprinkled with poetry are child oriented.

Tulips—Taxonomy, Morphology, Cytology, Phyto-geography and Physiology, Z.P. Botschantzeva. Translated and edited by H.Q. Varekamp. Distributed in the U.S. by A.A. Balkama, 99 Main St., Salem, NH 03079, 1982. \$70.00.

Tulips are not readily associated with the Soviet Union. Consequently, Professor Botschantzeva's epic work, recently translated from the Russian, is a bit surprising. Less so is the publisher, Balkama of Rotterdam.

This book, first prepared as a doctoral dissertation in 1960, presents an exhaustive coverage of Middle Asian tulips. The author spent many years in tracking down these wild tulips in their native habitats which ranged from the steppes, to the mountains and semi-deserts.

The book begins with a highly technical systematic review of the entire genus, and then proceeds to a detailed examination of the sixty Middle Asian species. Magnificent color plates, reproduced from original water colors by G.A. Semenov, further enrich the book. The many graphs, charts, and illustrations make *Tulips* a splendid library reference.



compiled by PENNY BUNKER

NOW IS THE TIME

A CULTURAL CALENDAR OF CARE FROM OUR AFFILIATES

BEGONIAS MARGARET LEE

Now is the time

to protect plants exposed to heavy rains, especially rhizomatous and semi-tuber types growing in containers.

to add more potting mix to keep roots covered where soil may be washed out of pots.

to watch watering program; less water is needed at this time due to slower growth, but do not allow to become too dry or wet.

to keep plants clean; remove old and dead foliage. to spray for mildew.

to control slugs, snails, mealybugs, and loopers.

to start in February tuberous types for summer bloom.

to start cutting back lightly on cane and shrub types towards the end of February, about Washington's birthday.

BONSAI DR. HERBERT MARKOWITZ

Now is the time

to collect native stock in the California region. Plant native trees in larger containers, not bonsai pots.

to remember not to overwater. Protect plants from too much moisture if a rainy period; they need less during this slower growth period, but do not let them dry out.

to watch for aphids and other sucking insects and spray accordingly.

to use a dormant spray such as copper-oil or lime-sulphur mixture, particularly on maples, quince, and other deciduous trees after they have been pruned.

to graft conifers during January and deciduous

trees in February.

to observe deciduous trees carefully. If there is warm weather in late February, keep the trees in shade so they will not start sprouting and blooming too early.

BROMELIADS LINDA PRELL

Now is the time

to be careful about watering—do not water plants when cold and rainy.

to dump water out of plant cups to prevent damage during cold spells making sure water does not freeze in the cups in frost areas.

to protect plants at night in frost areas. Cover with newspapers, sheets, etc., or put them in the garage, if necessary.

to wait to fertilize until weather is warmer—late February.

to check for snails and slugs. Spread bait on soil, not in cups.

to give colored leaved varieties more exposure to winter sun.

CACTI & SUCCULENTS VERNA PASEK

Now is the time

to protect from too much water. Try to keep on the dry side in cool temperature areas.

to protect tender cacti and succulents from frost.

to let the rains take care of plants in the ground and exposed pots.

to collect rain water to use other times of the year.

to inspect for insects and scale. Wipe scale off with a cotton swab dipped in alcohol and water or spray with that mixture, or pyrethrum,

or malathion.
to watch for snails and slugs.
to withhold fertilizers; plants need a rest this time of year.

CALIFORNIA NATIVES CALIFORNIA NATIVE PLANT SOC.

Now is the time

to sow seeds of wild flowers in prepared beds.
to plant and transplant natives so they can become established and thrive during the rainy season.
to check plants after heavy rains, making sure that water does not stand around them, or that mud does not build up above the original soil line on the main stem.
to reorganize your garden, grouping natives, Australians, and other drought-resistant plants together.

CAMELLIAS BENJAMIN BERRY

Now is the time

to water as necessary to supplement the rains.
to remember camellias like moist, but not wet soil.
to continue to spray for looper worms. Dust with chlordane for leaf beetles.
to renew mulch where needed; use fir bark or pine needles.
to feed 0-10-10 fertilizer. Do not fertilize newly transplanted bushes, but water well and often with vitamin B₁ solution.
to plant and transplant while plants are in bud or bloom, before new growth starts.
to remove poor and old blossoms to prevent fungus build-up.
to use a fungicide, if needed.

DAHLIAS ABE JANZEN

Now is the time

to start in February to prepare the planting bed. Turn the soil, add humus, and fumigate. Two or three weeks before planting, thoroughly dig in humus and equal parts of superphosphate and sulphate of potash and turn well.
to cut off tops just above the soil level, and dig any tubers left in the ground. (By early January the tops should be completely withered.)
to store tubers without dividing them; leave on any soil that clings to tubers. Store in vermiculite or sand and keep in a cool area.
to inspect those tubers stored earlier for signs of

shriveling; if too dry, add a little moisture.
to start in February some selected roots to sprout; these may make good cuttings. Bottom heat can be applied to encourage sprouting.

EPIPHYLLUM FRANK GRANATOWSKI

Now is the time

to feed mature plants with 0-10-10 nitrogen-free or low nitrogen fertilizer to promote blooming in the spring. Either liquid or time-release granules can be used. If liquid is used, another application may be necessary in about 30 days.
to prune out dead and unsightly growth to improve appearance and give more energy to newer and healthier branches.
to maintain preventative pest control by keeping plant containers free of debris. Spray with insecticides only when absolutely necessary; read and follow directions carefully. (Orthene, malathion, and cygon are available locally.)
to bait for slugs and snails. A few granules of *Slugetta* placed at the base of plants has proved very effective and leaves little or no unsightly residue.
to take advantage of beneficial rains. If plants are potted in proper porous soil, even prolonged heavy rains will have no harmful effect on them. Collect rain water for future use. Store in covered opaque containers to prevent infestation of mosquito larvae and build up of algae.

FERNS RAY SODOMKA

Now is the time

to spray for aphids, especially maidenhair.
to water gently, but do not soak. On cool nights soaking keeps their feet too cold. Do not rely on the rain to find your hidden and covered plants; they may remain dry.
to trim off old fronds in frost free areas.
to fertilize platyceriums (stag horns) bone meal, hoof & horn, or a high nitrogen liquid.
to remove and remount platycerium pups.
to plant spores.
to check for spider mites on underside of fronds. Mites are very small and may not be seen—fronds will be silvery on top and start to turn brown. Spray with malathion or miticide.
to repot, rebasket, and divide ferns in frost free areas.

FUCHSIAS BILL SELBY

Now is the time

- to prune fuchsias severely if not done in the fall.
- to clean up all leaves and other trash in baskets, pots, and around ground plants.
- to spray remaining foliage and ground to eradicate pests that may winter-over.
- to keep plants moist, but not wet.
- to feed with a good fertilizer—fish (10-5-5) or a slow release type. These can be used for your year-round feedings.
- to make cuttings of the tender ends as you prune, then by July you will have a fresh plant.

GERANIUMS CAROL ROLLER

Now is the time

- to water only when plants have become fairly dry. Each watering should moisten the entire soil ball. Excess water should escape through the drainage holes.
- to continue feeding a balanced fertilizer dissolved in water, using it at half the recommended strength every 4th or 5th watering or as often as needed to keep plants from developing deficiencies.
- to prune plants that have not been cut back. Some green leaves should remain on every stem cut back. Lanky plants which were pruned in the fall can be pruned again to produce compact plants.
- to tip-pinch plants pruned in the fall.
- to make cuttings from prunings. Shelter cuttings from extreme weather conditions.
- to continue pest and disease control, using products according to the manufacturers' directions.
- to give temporary shelter from freezing, if temperatures fall below 30° F.
- to rotate plants regularly for symmetrical shape.

GESNERIADS MIKE LUDWIG

Now is the time

- to be sure not to water on a cold or cloudy day, or late in the afternoon.
- to check underside of leaves and crown of plants. If necessary, spray for pests and disease as plants are somewhat dormant and less subject to damage.
- to prepare pots for spring planting season. Wash with hot water and let them stand overnight in chlorox solution to kill unwanted pests. Wash

thoroughly after soaking and air-dry.

- to send for catalogues for spring ordering; order supplies to have on hand when needed.
- to start achimenes rhizomes now. Place them on damp bed of vermiculite in a shoe box; watch new growth for mold. There should be signs of new growth in 15 days if the temperature is warm enough. Plant them in a loose mix, barely cover, water thoroughly, and wait for the sprouts to show through the soil.

IRISES SAN DIEGO-IMPERIAL COUNTY IRIS SOCIETY

Now is the time

- to make last plantings of the bulbous irises for spring bloom.
- to watch watering, if rains are light. Rhizomes should not dry out.
- to start a regular spraying program with copper oil to help control rust.
- to establish a regular program of snail, slug, and aphid control.
- to keep old brown fans off the tall-bearded. Good ground cleaning and spraying is helpful in pest control.
- to start in February to feed, but do not over fertilize, all irises with 0-10-10 liquid fertilizer. Follow directions carefully.

ORCHIDS CHARLIE FOUQUETTE

Now is the time

- to be aware of a sudden temperature drop in outlying areas.
- to remember the position of the sun is in the south, but there are days when it can still burn plants.
- to check for moisture in pots of phals and cattleyas; do not be fooled by gray days.
- to check name tags on plants. Be alert; do not lose identification.
- to give dendrobium nobile hybrids cool nights to encourage bud initiation (3 to 4 weeks at 40° F. is sufficient), but do not let them freeze. Give just enough water to keep them damp.
- to check burners and valves for leaks, check wires to transformers, regulators, and thermostats.
- to water early in the day so crowns will be dry by nightfall.
- to water the many orchids that do not have pseudo-bulbs for water storage.
- to use low nitrogen fertilizer on cymbidiums. Do

not feed if overcast.

- to stake up flower spikes on cymbidiums; place light-flowered plants that are in bud and flower, in shade to prevent fading.
- to remember phals should be spiking. If a plant is moved, place it in same general direction and area so the flowers will bloom in a uniform manner.
- to protect variegata oncidiums by shielding them from rain and cold wind blasts.
- to protect plants with a shelter; remember heavy rains and hail damaged many flowers last year.

ROSES SAN DIEGO ROSE SOCIETY

Now is the time

- to plant bareroot roses, mounding each bush with damp soil until new growth starts, to prevent dehydration.
- to prune roses—watch for dates of the demonstration on pruning in Balboa Park, San Diego.
- to finish all major pruning jobs and follow with a garden cleanup—a good dormant spraying of bushes and the surrounding areas.
- to cultivate established roses as new growth starts and feed, using one cupful per bush.
- to give newly planted bushes a feeding of liquid fertilizer six weeks after planting.
- to start preventative spraying in February for mildew and aphids. Use ½ strength on new foliage.
- to add iron chelates after roots start growing (iron can only be absorbed by new roots).
- to supply adequate water—especially if no rains—when rose bushes are growing rapidly.

VEGETABLES GEORGE JAMES

Now is the time

- to start seeds indoors of spring vegetables that can be transplanted, such as tomatoes, peppers, squash, and cucumbers to be planted in the garden about the middle of March.
- to plant roots of perennial vegetables and berry plants in the garden as rains and cold weather are not likely to harm them.
- to set plants of broccoli, Brussels sprouts, cabbage, celery, chard, cauliflower, and collards any time the soil is dry enough to work.
- to plant divisions of artichoke, roots of asparagus, and plants of fruiting berry vines as soon as possible—before the end of February.
- to plant onion sets and make a second planting of lettuce, using started plants.

GREEN THUMB PENNY BUNKER

Now is the time

- to start plantings of gladiolus bulbs and make successive plantings at monthly intervals for flowers over a longer period of time.
- to plant hybrid amaryllis bulbs, with the tip of the nose just showing, in a sunny or semi-shaded area.
- to make marguerite cuttings from new tips. Remove lower leaves and insert cutting in rooting medium. Keep in shaded place until rooted.
- to be drastic and cut chrysanthemums back to the ground.
- to plant bareroot stock of deciduous fruit trees, shade trees, shrubs, and vines.
- to prune out old branches on pyracanthas after berries are gone and shape as necessary.
- to apply dormant sprays to deciduous plants, especially roses and fruit trees—kill eggs and larvae of harmful insects and some fungus spores.
- to continue control of slugs and snails.
- to renew mulch where necessary, using fir bark, pine needles, ground bark, or manure.
- to select plants while in bloom from nurseries.
- to prune flowering trees and shrubs to shape the plant. Use the flowers in arrangements or as gifts to friends.

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